# A NEW DIAGNOSTIC SIGN IN RECURRENT LARYNGEAL PARALYSIS[1]

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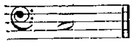
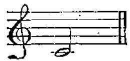
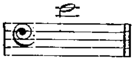
I make the report of this sign, not with the expectation and hope of its becoming one of the great diagnostic methods, but rather because it seems to me of interest in that it permits a quantitative estimation of the contractile ability remaining in a vocal cord in cases of recurrent laryngeal paralysis.

I have noticed in these cases where the lesion is monolateral that there is a very material difference in the upward excursion of pitch when the vocal apparatus is stimulated electrically during the singing of a tone.

To demonstrate this it is necessary to bare the neck completely and by careful palpation determine the angle on each side of the larynx formed by the cricoid and the thyroid cartilages. A small button electrode with a thumb circuit breaker is placed in this angle over the cricothyroid membrane, pressing back slightly the sterno-hyoid muscle, and then the patient is instructed to sing the note C. For a man this should be  and for a woman . On the normal side there will be a rise in pitch equal to from seven to fourteen half-tones, or in other words the excursion will be an interval of from a perfect fifth to a major ninth or over. On the paralyzed side, however, the tone will only be raised from two to three half-tones—a major second or a minor third.

As the amplitude of this excursion varies in the normal individual according to the pitch of the note from which the test is made, it is desirable to employ in all cases the same note. For this reason I have suggested the C indicated, as it is found in every voice no matter of what register. To illustrate how different the findings might be if a different note were taken, suppose that a man were told to sing E, , and let us suppose that the voluntary range of his vocal scale only extended to the G—a minor third above this—it would be manifestly impossible to get an excursion of more than three half-tones, although his vocal cords were in perfect condition. The C indicated gives a note in every voice which is free from muscular strain, and for this reason offers the best starting point for the test. The exact point at which to apply the electrode, although easily located from the superficial standpoint, is at times hard to find and frequently trials with gentle pressure at different angles are necessary to elicit the phenomenon. But when once found the reaction is certain and admitting of no doubt. The strength of current used has never to be such as to cause pain.

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Unless the physician is able to place the tone C without aid—which is by no means common—he must have recourse to a tuning fork or some musical instrument. With a little practice one should become fairly familiar with the musical intervals if not cortically deficient in this respect. I should like to call attention to the possibility of confusing perfect fourths with perfect fifths, and vice versa. This is easily explained when we remember that the inversion of a perfect fourth gives a perfect fifth, and of a perfect fifth gives a perfect fourth. The ear hearing the interval of a fifth at times refers the upper note down one octave or the lower note up one octave, in either case producing mentally a fourth. By the same mental process a fifth can be perceived where a fourth is sounded. The intervals of the octave, the second, major or minor, or of the sevenths, major or minor, will cause no trouble in detection. The interval of the diminished fifth, or, what is the same thing, augmented fourth or tritone will cause confusion to the unmusical.

Thirds and sixths are of easy detection, but it is not always possible for the uninitiated to differentiate between the major and minor thirds and sixths. This is possibly explained by the fact that an inversion of a major interval produces a minor and vice versa. I do not think it advisable to more than touch on this subject of intervals because any one so inclined can get a full description of them in any text-book on harmony or thorough bass. For this purpose I most highly recommend the first chapter in Hugh A. Clarke's "A System of Harmony," Theodore Presser, Philadelphia, publisher.

The points to which I have called attention are most necessary to observe if anything like a quantitative test of vocal cord power is to be made.